MAGYAR & ASSOCIATES, INC.

P.O. Box 5377
Bethlehem, Pa. 18015

Thursday, March 12, 1998

Phone#   (610)758-8595
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Quotation# 8M032CM

To: **Steven P. Lowry & Associates**

Attn: **Steven Lowry**

From: Mike Karpa

Total # of Pages: 2

Subject: Control Microsystems SCADA System Quotation

Dear Steve,

In follow up to our conversation earlier this week, I would like to propose the following SmarWIRE SCADA package for DonMoyer's Nucor Steel application. As discussed, you will need to provide an enclosure for this system and a commercial grade modem. We distribute these products through Control Microsystems direct and would appreciate any purchase orders be addressed to Control Microsystems c/o Magyar and Associates. If you have any questions please don't hestitate to give me a call, otherwise I will plan to be in touch early next week.

Sincerely,
Mike Karpa

MAGYAR & ASSOCIATES, INC.

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Bethlehem, Pa. 18015

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Lookout 100 I/O Development System (part# 310050) $5,990
License to use Lookout to develop, edit/modify, and
continually monitor and control a system on one computer.
Includes: Lookout License Agreement, disks, Reference
Manual, Windows Draw graphics design package, all tools
necessary for Lookout application development/runtime
system, and all available protocol drivers.

Model 5202 RS-232 Communication Processor (part# 297111) $552

Model 5501-20 8-Channel Analog Input Module (part# 297113) $558

Model 5103 Power Supply Module (part# 297102) $456
14-40 VDC and/or 16-24 VAC input
5V @ 1.0 ampere, 24V unreg @ 500 mA

Model ACX24 Transformer (part# 294000) $65
120V-24V

Model DIN17 Rail (part# 297128) $16

Model SSM System Manual (part#297141) $98

Total List Price: $7,735
Less 50% OEM Discount
Total Sale Price: **$3,867.50**

Quote Valid For 60 Days

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Smart WIRE

SYSTEM ARCHITECTURE

Each SmartWIRE node consists of a power supply, a communication processor, an optional modem and one or more 5000 Series I/O modules. These modules are DIN-rail mounted and are interconnected by short cables which are supplied with each module.

The communication processor provides an RS-232 or RS-485 serial port which emulates the Modbus protocol. All communication with the SmartWIRE system occurs via the serial port. In addition, the communication processor provides a 100,000 baud synchronous serial port through which it accesses the 5000 Series I/O modules. Up to forty-eight 5000 Series I/O modules may be connected to this bus, providing a maximum I/O count of 64 digital inputs, 64 digital outputs, 64 analog inputs, 32 analog outputs, and 64 counter inputs (288 total I/O).

Each communication processor is assigned a unique Modbus station number using DIP switches. When a protocol master polls a specific station number, all stations receive the message but only the one to which it is addressed responds. Error detection uses CRC-16 or additive checksums in conformance with the Modbus RTU and Modbus ASCII protocols. Both versions of the Modbus protocol are emulated by the SmartWIRE.

With up to 255 SmartWIRE nodes per network, the maximum possible I/O capacity is 16320 analog inputs, 16320 digital inputs, 16320 digital outputs, 8160 analog outputs, and 16320 counter inputs.

END-TO-END TELEMETRY

In an end-to-end SmartWIRE system, two or more SmartWIREs are connected together through the communication system, which can be telephone, direct wiring or radios. Input signals from one location are reproduced as output signals at another location. This architecture is used for cable reduction and I/O signal telemetry applications. The principle characteristic of end-to-end telemetry is that no PC, PLC or DCS is needed. The SmartWIRE system operates on a stand-alone basis.

When used for end-to-end telemetry, one of the SmartWIRE communication processors is configured as the Modbus protocol master. Using Modbus, this unit polls each SmartWIRE to read the status of input signals, which are then transmitted to the outputs on a corresponding SmartWIRE. A powerful adaptive polling algorithm in the master automatically adapts to the communication system characteristics for maximum throughput.

An interesting feature of SmartWIRE is that it can also poll and write to any Modbus compatible equipment such as programmable controllers, flow computers, valve controllers, etc. Therefore, a SmartWIRE telemetry system can be used to read data directly out of a remote flow computer (for example), and reproduce the data as analog and digital outputs at another location.

REMOTE OR SLAVE I/O

When SmartWIRE is used as remote I/O or slave I/O, a personal computer, remote terminal unit (RTU), programmable controller or distributed control system acts as the Modbus protocol master. Using the Modbus ASCII or Modbus RTU communication protocols, the host can poll/write up to 255 SmartWIRE units.

Virtually all PC-based operator workstation software supports the Modbus protocol. So do many RTUs, PLCs, DCSs and man-machine interfaces (MMIs). Any device which can act as a Modbus master can interface with SmartWIRE.

Modbus devices which can only act as slaves can often be interfaced to SmartWIRE by configuring the SmartWIRE as the master. In this case, the SmartWIRE itself will control the communication.
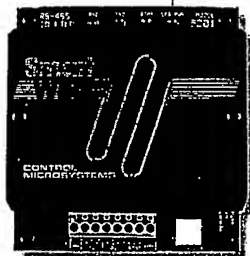
HOST COMMUNICATIONS

Control Microsystems products support multiple modem options, RS-232/RS-485 converters, VHF/UHF radios, and unlicensed 900 MHz radios for use with all manner of telemetry and SCADA communication systems. Please consult your local sales representative or contact Control Microsystems technical support to determine the optimum solution for your requirements.

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RS-485 Communication Processor

Model 5201
Part No. 297101

No Programming Required*

Simple Configuration

Industry-Standard Protocol

Accepts 64 AI, 64 DI, 64 DO, 32 AO

Watchdog Timer & Status Output

Up to 32 of these communication controllers can be multi-dropped on a 4000 foot long 2 or 4 wire RS-485 network. Baud rates up to 115.2 KBaud provide high throughput. Use with PCs or back-to-back for cable reduction/multiplexing.

RS-232 Communication Processor

Model 5202
Part No. 297111

No Programming Required*

Simple Configuration

Industry-Standard Protocol

Accepts 64 AI, 64 DI, 64 DO, 32 AO

Watchdog Timer & Status Output

Use this communication controller with modems like the Model 5902 Bell 202 modem (shown below), radio modems or spread-spectrum radios. Also suitable for direct connection to PCs or PLCs. Baud rates from 300 baud to 38.4 Kbaud.
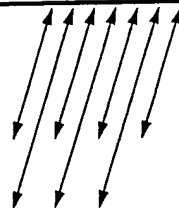
Should your project require a programmable controller, Control Microsystems can offer you the TeleSAFE Micro16. Programmable in both C and Ladder Logic, the TeleSAFE Micro16 uses the same 5000 Series I/O Modules as SmartWIRE.

For more information, please consult the TeleSAFE Micro16 brochure, or contact your local Control Microsystems representative.
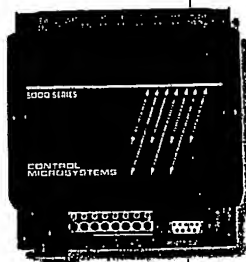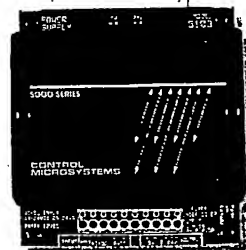
POWER SUPPLIES MODEMS

5000 SERIES

Bell 202 Telephone or Radio Modem

Reliable 1200 Baud FSK

Transformer and Optical Isolation

Point-to-Point or Multi-Point

Soft Carrier Turnoff

Anti-Streaming Network Protection

Model 5902
Part No. 297120

Use the Model 5902 Modem for communication over telephone lines, dedicated wiring or radios. Provides outstanding performance with very low bit error rates - even on poor lines. Model 5902SA stand alone version for PCs/PLCs.
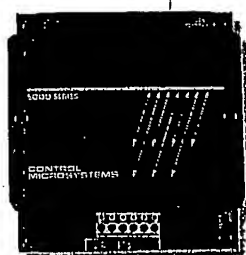
Uninterruptible Power Supply

Dual Outputs, 5V @ 1 A, 24V @ .5A

Built-In Battery Charger

Outputs Isolated From Input

Dual AC/DC Inputs, 14-40VDC, 16-24VAC

Cool Running DC-DC Converter

Model 5103
Part No. 297102

The Model 5103 provides the operating power for a SmartWIRE system. Add battery backup simply by connecting the Model 1206 Gel/Cell battery. Also makes an excellent uninterruptible power supply for general field use.

ANALOG INPUT/OUTPUT MODULES

Analog Output

2 Optically Isolated Outputs

Configurable 0 mA/4 mA Zero Scale

Excellent Linearity

Accepts 12V-24V Loop Power
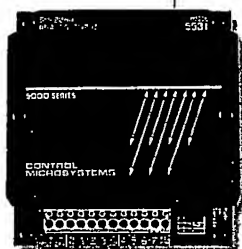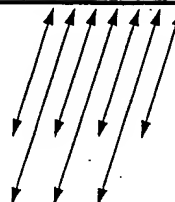
Model 5301
Part No. 297112

The Model 5301 Analog Output Module provides true 12 bit performance, with user configurable 0mA/4mA zero scale. Can also generate voltage outputs with use of load resistor. Suitable for solar sites with only 12V loop power.

7

ANALOG INPUT/OUTPUT MODULES

Analog Input (5 V or 20 mA)

8 Optically Isolated Inputs

Configurable Zero Scale

True 12 Bit Performance

Transient Protected
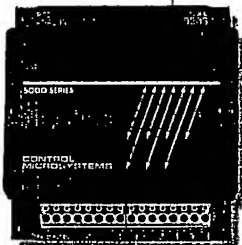
Model 5501
Part No. (Please consult the Configuration Guide)

Available in a 5V or a 20 mA Input Range, the Model 5501 Analog Input Module features a 12 bit successive approximation A/D converter with isolation and transient suppression. The 5 V unit's Zero Scale is configurable 0V/1V, while the 20 mA unit is configurable 0mA/4mA. The 20 mA module is the same as the 5 V module, but with precision 250 ohm shunt resistors installed.

RTD Input

4 Optically Isolated RTD Inputs

Minimal Self-Heating

Configurable for 6 different Input Ranges

Transient Protected
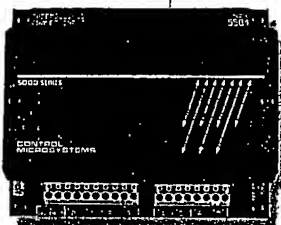
Model 5503
Part No. 297151

The 5503 RTD Input Module is a 4-channel, 100 ohm RTD input card for both 4-wire and 3-wire connections. The 5503 eliminates the need for additional temperature signal conditioning or transmitters required to match the industry-standard 4-20 mA inputs found on most PLCs and RTUs.

Thermocouple Input

8 Type J, K, T, E or ±80 mV inputs

Optical Isolation for high reliability

Linearized and Cold Junction Compensated

Transient Protected

Model 5504
Part No. 297166

The 5504 Thermocouple Input Module is an 8-channel thermocouple input card for type J, K, T, & E thermocouples. The 5504 eliminates the need for additional temperature signal conditioning or transmitters required to match the industry-standard 4-20 mA inputs found on most PLCs and RTUs.

Analog Input Simulator

8 Potentiometer Adjustable Inputs

Precise, Multi-Turn Potentiometers

12 Bit Performance

Perfect for Simulation or Testing

Use for Setpoint/Alarm Level Input

Model 5521
Part No. 297119

The Model 5521 Potentiometer Analog Input Module is ideal for simulations, testing or operator input such as alarm levels. True 12 bit performance and precision potentiometers allows precise adjustment of the input value.

8

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